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# ESA CERTIFICATE IN CADASTRAL SURVEYING

EGYPT FINANCIAL SERVICES PROJECT  
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## DATA PAGE

Submitted by:	François Pépin, Acting Chief of Party Egypt Financial Services (EFS) Project 4 Hayet El Tadrees Square Dokki, Cairo, Egypt Tel: (20) 2 762-6140 Fax: (20) 2 762-6150 www.egyptfs.com Contract No. 263-C-00-05-00003-00
Submitted to:	EFS CTO: Paul Bruning EFS DCTO: Ingi Lotfi Private Sector Programs Office of Policy and Private Sector USAID Mission to Egypt
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KRA:	KRA 2.3 Implementation Plan for Two Model Office Locations
Activity:	2.3.19 Training program to support first and subsequent registration
Author:	Task 2 Registration Team with Principle Author Dr. Moustafa Radwan
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**Course Duration:**

12 weeks

**Place:**

ESA Training Centre

**Context:**

This course is designed within the context of on-going initiatives in Egypt to establish a parcel based cadastral system in urban areas. Surveyors from both ESA and the private sector (individuals as well as companies) should be able to perform tasks to support these initiatives in a competent and efficient manner. This course (one of two) has been designed to allow ESA to cooperate with, and formally recognize individuals and companies from the private sector and its own staff, as being capable to undertake survey work on ESA's behalf to establish and maintain a parcel based cadastral system:

***ESA Certificate in Cadastral Surveying I*** with an emphasis on the efficient use of methodologies in the field and in the office, utilizing digital technology, to establish a parcel-based cadastral system in urban areas. This course is outlined here.

***ESA Certificate in Cadastral Surveying II*** with an emphasis on the use of the parcel-based cadastral system to support subsequent land transactions within the framework of Egyptian laws for land tenure. This course is yet to be developed.

Together these courses will provide a track by which Surveyors can achieve licensed status. Licensing is a subject currently being explored by EFSP, Task 2.

**Course Objectives:**

The course aims to provide training in the use of efficient methodologies in the field and office to prepare a cadastral index map to support first registration (the introduction of *Sigueal el-Ainee* in urban areas) and covers GIS and mapping technologies, standards and quality control procedures and the tasks involved in the field and office operations. Course participants will also learn how to plan and implement field work and supervise junior technologists.

**Target Group:**

- ESA Cadastral Sector staff
- Surveyors (individuals or members of private companies) who wish to work as cadastral surveyors and undertake work on behalf of ESA.

**Course Structure:**

The course consists of 6 teaching modules:

- Module 1: Introduction to Cadastral Surveying (1 week)
- Module 2: Methods and Technologies for Field Operations (2 weeks)
- Module 3: Methods and Technologies for Office Operations (2 weeks)
- Module 4: Preparation of Cadastral Maps and Ownership data (2 weeks)
- Module 5: Managing Operations and Quality Control (1 week)
- Module 6: Course Project 'The preparation of the Survey Book and Cadastral Index Map' (4 weeks)

Course participants will be evaluated in each module by means of exams, practicals, reports and presentations.

**Course Prerequisites:**

Course participants should have a minimum qualification equivalent to a 2-year degree course in surveying from the High Survey Institute (or similar Institute) and 5 years experience in surveying work. In a special cases, Surveyors with High School Certificate and 10 years of experience will be considered. Participants should have proficiency in both English and IT use. Experience with digital surveying equipment and/or computer graphics would be an advantage.

## **TEACHING MODULES**

### **INTRODUCTION: ADMIN AND LOGISTICS**

1. Course overview, timings and course objectives
2. Trainers taking the course

### **MODULE 1: INTRODUCTION TO CADASTRAL SYSTEMS (ONE WEEK)**

#### ***M1-1: An introduction to Cadastral Systems***

1. What are cadastral systems? The concepts and components.
2. Cadastral systems and the surveyor – roles, responsibilities and the ethics of the profession.
3. Introduction to the mapping and the cadastral profession in Egypt, challenges and opportunities to improve services.
4. The on-going initiatives to establish cadastral system and job opportunities.

#### ***M1-2: Legislation and Institutional setting***

1. Egyptian Laws and legislation in relation to cadastral mapping.
2. The role, responsibilities and the interaction between the public bodies involved in the provision of cadastral services in Egypt: the Egyptian Survey Authority (ESA), the Real Estate Publicity Department (REPD), the Real Estate Tax Department (RETD), banks and financial bodies.
3. The role, responsibilities and liability of the private sector involved in the cadastral profession and its relation with the public sector.

#### ***M1-3: Establishing a Cadastral System under First Registration***

1. What is Title Registration, First Registration explained.
2. Ongoing initiatives in Egypt to complete land registration under *Sigueal El-Ainee* (the introduction of title registration in urban areas).
3. The role of REPD and ESA in First Registration.
4. An introduction to surveying tasks to support first registration under the current legislative and executive framework - creating a cadastral index map, adjudicating and verifying ownership and creating the ESA Survey Book.
5. An introduction to the proposed new methodology to support first registration in urban area – performing an as built survey.

## **MODULE 2: METHODS AND TECHNOLOGIES FOR FIELD OPERATIONS (TWO WEEKS)**

### ***M2-1: An Overview of the Field Operations, Methods and Technology for Cadastral Surveying***

1. Review of various methods and digital technology for surveying & mapping.
2. An overview of field operations, planning and preparation, tasks involved and quality control

### ***M2-2 Field Surveying***

1. Introduction to coordinate systems, coordinate transformations and map projections.
2. Using Total Station and GPS to establish of reference points and perform surveying.
3. Point determination using GPS, field operations, data processing and calculations of coordinates.
4. Surveying using Total Stations for surveying
5. Making measurements using Tape

### ***M2-3 Standards for Surveying***

1. Standards for Control Surveys
2. Standards for Cadastral Surveys

## **MODULE 3: METHODS AND TECHNOLOGIES FOR OFFICE OPERATIONS (TWO WEEKS)**

### ***M3-1: Overview of Office Operations***

1. Overview of office operations to create cadastral maps and record ownership information; methods, workflows and technology used.

### ***M3-2 An introduction to GIS and database systems***

1. Definition, functionalities and components of GIS and Database Systems.
2. GIS operations: data input, data management, data analysis, output.
3. Database operations: data input, data management and reporting.
4. *Practice with GIS System (ArcGIS or equivalent).*
5. *Practice with a RDBMS (Access or equivalent).*

### ***M3-3 Incorporating survey data in GIS***

1. Data loading and verification
2. Producing sample plots and maps

### ***M3-4 Scanning and indexing maps and plans***

1. Scanning and digitising maps and plans
2. Vectorizing raster data to extract parcels, building and other relevant features
3. Verifying data capture
4. Indexing Mutation forms
5. Verifying data entry

### ***M3-5 Standards for Cadastral Mapping***

1. Accuracy
2. Cadastral Symbols



## **MODULE 4: PREPARATION OF CADASTRAL MAPS AND OWNERSHIP DATABASE (TWO WEEKS)**

### ***M4-1: Stages and operations for the production of the Ownership Database***

1. Overview of stages
2. Principles of ownership database
3. Database structure

### ***M4-2: Stages and operations for the production of Cadastral Index Map***

1. Overview of stages for the production of cadastral maps
2. Specifications of cadastral index map

### **M4-3: Cadastral Information Collection**

1. Overview of spatial and ownership documents, bodies involved, their role and responsibilities.
2. Study various forms and documents.
3. Field and office methods for the assessment of documents under governing legislation.
4. Practice with data collection and verification of ownership information.

### ***M4-4: Integration of Spatial Information***

1. Geo-referencing
2. Practice with the download of graphic data from various sources (graphics: existing digital maps, data from field survey, scanned maps).
3. Integration and geo-referencing of various data sets and identification of mismatches.

### ***M4-5: Field Verification***

1. Field verification of parcel boundaries and ownership data and corrective actions.
2. Practice with adjustment of parcel boundaries.
3. Review and study of documents for approval.
4. The role of ESA and REPD for the approval of boundaries and ownership data.

### ***M4-6: Preparing Parcel Map and Ownership Database***

1. Prepare surveyed data (from field survey operations), scanned maps for input in a GIS
2. Enter Ownership data into Ownership database
3. Use GIS system to edit existing digital maps with new field survey data for parcels information (field data for parcel survey and ownership data)
4. Practice with cartographic tools for the production of index map.
5. Practise the use of the GIS and database systems for simple cadastral transaction operations: change owner data use specific format, change map features and cadastral parcels with new survey data use specific format
6. Provide parcel information in (graphics and associate ownership information) in a specific format.

## **MODULE 5: MANAGING OPERATIONS AND QUALITY CONTROL (ONE WEEK)**

### ***M5-1: Quality Control procedures***

1. Concept of Quality
2. Quality control
3. Process description
4. Concept of Total Quality Management
5. Making quality report
6. Applying Quality in cadastral mapping

### ***M5-2: Brief on Operations Management***

1. Concept of project management; planning of activities, execution of tasks, assignment of resources, monitoring performance and evaluation of results
2. Concept of operations management, resource management, scheduling of activities, assignment of resources
3. Costing of activities
4. Concept of performance management (time, costs, resources and quality)
5. Applying project planning on a simple cadastral process
6. *Demo: Using MS Project for planning*
7. *Report writing*

## **MODULE 6: PRACTICAL PROJECT (4 WEEKS)**

Apply knowledge acquired in the course to build a parcel-based cadastral system in a pilot area (yet to be defined). Activities include but will not be limited to:

1. Reconnoitre pilot area and identify the requirements to build a parcel-based cadastral system.
2. Identify the various stages of work, tasks involved and prepare a flow chart of all activities involved in both field and office.
3. Planning and schedule activities for both field and office work.
4. Allocate resources and identify quality control procedures for each activity.
5. Execute field operations in the pilot area.
6. Establish a parcel-based database using GIS system.
7. Produce a cadastral index map according to ESA cartographic specifications.